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High Value Manufacturing news  
Issue 09 | May 2020

**CATAPULT**  
High Value Manufacturing

# HVM CONNECT

**COVID19**  
SPECIAL ISSUE



**FREE**  
TECHNICAL PACK  
DOWNLOADS

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# WELCOME TO HVM CONNECT

## Your quarterly high value manufacturing update



**Rosa Wilkinson**  
Communications  
Director  
HVM Catapult

We live in unprecedented times. In generation-defining moments such as this, we are all judged by our actions. Whether by following social distancing measures, delivering key supplies or by supporting the frontline, we all have a role to play in helping flatten the viral curve and enabling our NHS to cope with the sudden influx of patients.

The HVM Catapult and wider manufacturing community have played a vital role in the national response to the COVID-19 outbreak. In this edition of HVM Connect, we look at how HVM Catapult Centres have been using their insight, connections and facilities to support the national effort whether that's in the development of new products, creation of vital PPE or, of course, in scaling up the manufacture of the life-saving ventilators our hospitals need.

I'm pleased to say that the work we are doing is not just about responding to today's demands. We know that even when we emerge from the crisis, our manufacturers will face significant challenges in a world that could look and feel very different. The good news is that the HVM Catapult's teams are already gearing up to ensure that firms are match fit when they step out into the 'new normal' that will follow this period of lock down.

We all know that a period of 'downtime' can give the room to think about new ways of doing things. It can also allow time to forge relationships with new partners. Through this crisis, the UK's engineering firms have already shown the amazing results they can deliver. Helping them to connect even better with the UK's world-leading research base will help them to shine even more brightly on the global stage. The HVM Catapult is committed to helping them to do so.

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- [linkedin.com/company/  
high-value-manufacturing-catapult/](https://www.linkedin.com/company/high-value-manufacturing-catapult/)
- [hvm.catapult.org.uk](https://hvm.catapult.org.uk)

# NMIS appoints first CEO

The National Manufacturing Institute Scotland, the overarching group for our centre the AFRC, has announced that John Reid has been appointed as Chief Executive Officer to lead the growth and development of the world-leading industry-led manufacturing research and development facilities at the heart of the Advanced Manufacturing Innovation District Scotland led by Renfrewshire Council.

John will take up position in August after successfully leading the Michelin-Scotland Innovation Parc (MSIP) in Dundee. Prior to leading MSIP John held the position of General Manager at the Michelin tyre plant on the same site.

John's appointment further strengthens the leadership team for the group, which includes the new flagship facility being built next to Glasgow Airport that was recently granted planning permission by Renfrewshire Council. ■

[READ MORE](#)



## HVM Catapult CEO defers retirement

Dick Elsy, Chief Executive Officer of the High Value Manufacturing Catapult, has announced that he will defer his planned retirement to support the manufacturing sector's response to the coronavirus outbreak.

Mr Elsy announced in January that he would retire from the HVM Catapult in August this year. Yesterday, in response to challenges UK manufacturers will face during the coronavirus outbreak, Dick confirmed that he would defer his retirement to support the national response to the virus.

He said: "Coronavirus presents immense challenges for the UK's manufacturers. In the short term they will be called on to step up to supply the nation's needs at an extraordinary moment in our history. Looking further ahead, they will need to be strong to weather the shock that the virus has given our economy.

I want to play my full part in mobilising the outstanding resources of the High Value Manufacturing Catapult to underpin their success until the situation stabilises and I can hand over to a successor."

Responding to Mr Elsy's announcement, Allan Cook, CBE, Chair of the High Value Manufacturing Catapult said: "I am delighted that Dick has generously decided to defer his departure from the High Value Manufacturing Catapult. His decision is typical of Dick's commitment to HVMC and the wider manufacturing sector. His deep understanding of UK manufacturing and his tireless passion for supporting the sector's businesses through innovation are vital qualities at a time when companies are facing exceptional demands and an uncertain future economy."

[READ MORE](#)



## FEATURE

# The Ventilator Challenge: Two months of success

**V**entilatorChallengeUK, the consortium of UK aerospace, automotive and medical businesses that has come together to produce at-scale medical ventilators for the NHS, celebrated two-months since it was formed last week.

Led by our very own Dick Elsy, the Consortium has focused its efforts on scaling up production of two devices since its formation on 19th March 2020. One an existing design made by Smiths Group, the other a new device based on an adaptation of existing technology from Oxfordshire-based Penlon.

VentilatorChallengeUK has worked closely with Penlon to modify and scale up production of its Penlon Prima ES02

device. The ventilator received MHRA approval on 15 April 2020, becoming the first newly adapted ventilator design to be given regulatory authorisation as part of the UK Government's fight against COVID19.

As well as producing the Penlon Prima ES02 device, VentilatorChallengeUK has also supported Smiths Group in scaling up the delivery of its



paraPAC plus™ ventilator with three brand-new production sites established in the past 8 weeks at GKN Aerospace's facilities at Luton and at Cowes and Rolls Royce at Filton.

In total, the 33-strong consortium has seen over 5,500 people working around the clock across nine sites to deliver both models of ventilator into the NHS.

Together, Penlon and Smiths would ordinarily have combined capacity to produce between 50 and 60 ventilators per week. Today the consortium is producing between 100-200 of the combined units per day as it seeks to deliver increased ventilator capacity to the UK. ▶



We have covered an incredible amount of ground in the two months since the Consortium was formed.

The progress we have made is testament to the effort and energy brought to the challenge by every member of the VentilatorChallengeUK Consortium team. They have never wavered in their determination to make sure that our NHS always has the number of ventilators it needs to treat this virus.

Although the UK is widely accepted to have passed the peak of infections in this first phase of the pandemic, we are continuing to scale up our production capabilities to make sure that there is always a ventilator available when a patient needs it should a second wave strike the UK. I look forward to seeing VentilatorChallengeUK deliver even more ventilators over the coming weeks."

**DICK ELSY**  
CEO, HVM CATAPULT

For more information and press enquiries, please visit the VentilatorChallengeUK website. ■

**FIND OUT MORE**



## AMRC rising to the ventilator challenge

**F**uturistic headsets programmed to enable skilled aerospace and automotive production line operatives to rapidly switch to the manufacture of 10,000 life-saving medical ventilators were rushed from the Advanced Manufacturing Research Centre (AMRC), part of the High Value Manufacturing (HVM) Catapult, to sites across the UK last week. At the same time, AMRC Cymru was turned into a production facility for the devices.

The augmented reality equipment is critical to the success of a powerful industrial consortium which has come together to accelerate the production of thousands of ventilators before the Covid-19

pandemic reaches its peak and risks overwhelming the ability of NHS doctors and nurses to treat a sudden surge in patients suffering from the virus. The industrial consortium, Ventilator Challenge UK, came together after the Prime Minister, Boris Johnson, made a plea for an additional 50,000 ventilators to be delivered to the NHS within a matter of weeks.

Under the leadership of the HVM Catapult, the AMRC and the Nuclear AMRC are at the heart of a multi-faceted campaign to deliver the additional ventilators, the first of which will be coming off production lines around the UK as early as next week, according to the Chancellor of the Duchy of Lancaster, ►

Michael Gove. The consortium is focusing production on two existing ventilator designs which meet the high-level specification for a Rapidly Manufactured Ventilator System (RMVS) developed by clinicians and the Medicines and Healthcare products Regulatory Agency (MHRA).

Dick Elsy, CEO of the HVM Catapult, which has seven centres across the UK including the AMRC and the Nuclear AMRC said:

“What we are seeing here is a truly collaborative, international effort, with the best and brightest engineering and manufacturing brains coming together to rally all their resources in response to the distress signal from the NHS.”

Within hours of the Prime Minister laying down his ventilator challenge, the AMRC and Nuclear AMRC were taking scores of requests for assistance, not just for ventilators, but also for medical equipment such as face masks and swabs and vials for Covid-19 test kits. To make sense of this, the Nuclear AMRC generated a communications log to streamline the most appropriate support by identifying those with the capability to best produce key products and sub-level components.

Professor Steve Jones, Chief Technology Officer at the Nuclear AMRC said:

“This information was refined and characterised



to fit with the government’s prescribed classification criteria. In the two weeks following the challenge, the Nuclear AMRC registered over 90 enquiries. These were then filtered to produce a focused and directly tangible suite of proposals to assess support from both within the Nuclear AMRC, the AMRC, our stakeholder community and the Fit for Nuclear supply-chain network.”

Manufacture of the ventilators will be scaled up at AMRC Cymru in Broughton in North Wales in collaboration with automotive giant Ford. The facility was recently opened by the First Minister of Wales, Mark Drakeford, whose government invested £20m in the state-of-the-art R&D operation to support the retention of Airbus wing manufacture in the region and 6,000 highly skilled aerospace engineers.

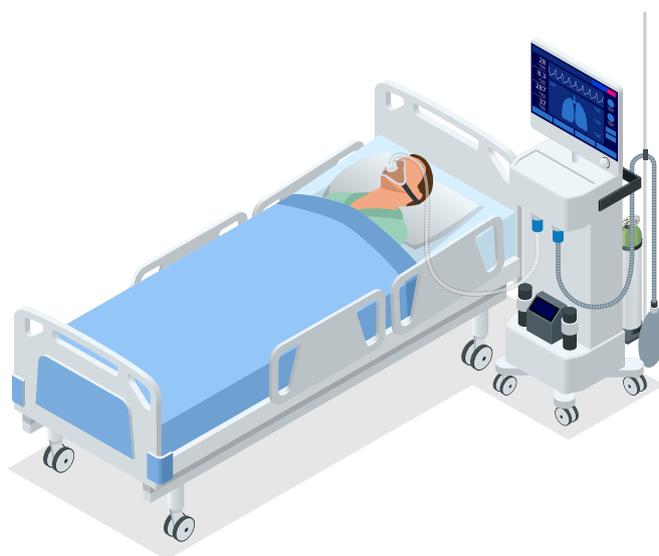
To enable rapid acceleration of production HoloLens headsets will be

used to fast track the training of operatives, while allowing them to keep a safe distance from one another in line with Covid-19 guidance. Microsoft tasked Professor Scott with coordinating their deployment across the country in the response to the government’s Ventilator Challenge. The high-tech equipment – initially designed for use in gaming – will be delivered with additional software provided by an AMRC partner, the US-based global augmented reality specialist PTC.

Rather than putting wearers of the headset in a fully computer-generated world, as virtual reality does, HoloLens allows users to place 3D digital models in the room alongside them; users can walk around the objects they create and interact with them using gestures, gaze and voice. ■

[FIND OUT MORE](#)

## ON THE COVER



# MTC develops intubation shield to protect NHS staff

Engineers at the Manufacturing Technology Centre have developed a fast-make shield to protect front line NHS staff involved in the intubation procedure for COVID-19 patients needing linked up to ventilators.

The protective shields, developed in collaboration with medical experts and industrial partners Rolls-Royce PLC, Aston Martin and Multimatic, with wider support from Innovate UK, have been developed from prototype to manufacture in less than a week.

The MTC and associated partners are in the process of manufacturing the first batch of 1,000 units and is also working with the manufacturing supply chain to ramp up immediate capacity to at least 200 units a day to meet expected NHS demand.

MTC chief executive Dr Clive Hickman said: “The acrylic shields with access panels for medical staff are manufactured as complete units or can be produced as flat-pack self-assembly kits. The shield has undergone several design changes during its rapid development following trials in three hospitals and extended trials at a further seven hospitals. Feedback from medical professionals suggests that the shields can be used during the intubation and extubation processes, and

may also be useful for other medical procedures beyond COVID-19 treatment.”

Technical design packs of the Intubation Shield are already available for download in a flat-pack and fabricated version. Further technical packs, including drawings and assembly instructions, are set to be published in the near future. ■

[DOWNLOAD HERE](#)

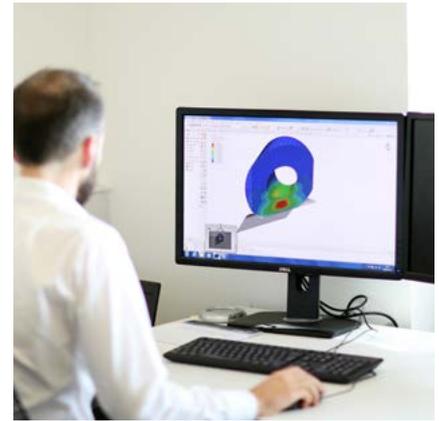


## Navigating the design to manufacture journey

Turning an idea into a scalable, commercial product is a challenge that faces many entrepreneurs, innovators and SMEs. Developing a new product, new functionality or new customer experience can be difficult, and the design to manufacture process must be given careful consideration to ensure that development costs and timelines are managed effectively.

KTN is hosting a series of events looking at the challenges facing innovators navigating the design to manufacture journey aimed at innovators, designers and manufacturers.

Details on the final event in this series are below.



[REGISTER HERE](#)

Wednesday 3rd June 12:00 - 13:00 Investment and Funding

## WMG helps British taskforce with new non-invasive ventilator

WMG is helping a body of British citizen scientists, medical clinicians, academics, manufacturers and engineers who have developed an alternative model of non-invasive ventilator to support the Government's drive to equip the NHS.

The new model, the exovent, is a cutting-edge reinvention of the archetypal iron lung which saved the lives of countless polio victims during the last century.

Marshall Aerospace & Defence Group, the UK's leading privately owned Aerospace and Defence

business, is exploring the technical aspects of the scheme ahead of rapid production and roll-out of the Negative Pressure Ventilator (NPV). The exovent concept is also supported by WMG at the University of Warwick and representatives from Imperial NHS Trust and The Royal National Throat Nose and Ear



hospital. Two leading intensive care units have agreed to trial the prototype ventilator support devices.

exovent is non-invasive, which means that patients do not need to have their windpipes intubated, so they don't need to be sedated or paralysed. Instead, they can remain conscious, take medication and nutrition by mouth, and talk to loved ones on the phone. It can be used on a normal ward, keeping patients out of intensive care. ■

[FIND OUT MORE](#)

# NCC prints protective face shields for Bristol hospitals

Following a shout out for at least 200 more protective visors for University Hospitals Bristol NHS Foundation Trust last week, a small team reopened the NCC workshop for production.

We've already modified the face shield design to provide greater comfort to the wearer and staff at the Bristol Royal Infirmary (BRI)

have approved this first visor (pictured left). The community of Long Ashton raided their sewing boxes to donate elastic to our design, before Dunelm in Weston-super-Mare opened their store to supply larger quantities just for us.

The visors contain 3D-printed parts. As 3D-printing can be time consuming, our partners are loaning us



some of their machines for the projects, multiplying our production capacity.

GKN Aerospace are going to supply the parts they are making to NCC for final assembly and delivery to BRI. ■

HVM CATAPULT HAS DONATED OVER  
**100,000**



**ITEMS OF PPE TO THOSE THAT NEED IT MOST**



HTC VIVE and Immerse UK present a Virtual Event Series:

## The Future of Work in VR

Join us for a series of virtual events to discuss the adoption of VR in the workplace and hear from a number of VR solution providers, customers and practitioners across of a number of different industries.

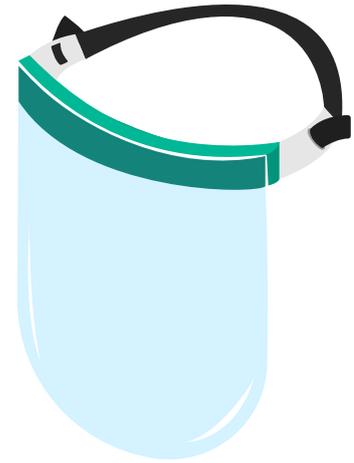
**Apr 21st (4-6pm BST) - Remote Work & Collaboration**

**Apr 30th (4-6pm BST) - Spatial Design**

**May 14th (4-6pm BST) - Training The Next Workforce**

**RSVP required**





# AMRC 3D prints protective face shields for NHS workers

**T**housands of protective face shields to help keep Sheffield's frontline NHS workers safe in the fight against COVID-19 are being made by a team at the AMRC, part of the High Value Manufacturing (HVM) Catapult. They are working around the clock to rapidly manufacture and assemble these essential visors.

Engineers from the AMRC's Design and Prototyping Group (DPG) have responded to the national call to produce more Personal Protective Equipment for healthcare workers by using technologies such as 3D printing and laser cutting to make up to 1,000 face visors per week.

The shop floor at the AMRC's Design and Prototyping Testing Centre has been transformed into an assembly production line and the team worked tirelessly over the Easter weekend to deliver the

first batch of 934 protective face shields to the Royal Hallamshire Hospital on Easter Monday. They plan to deliver an additional 1,000 visors to the Northern General Hospital by next week.

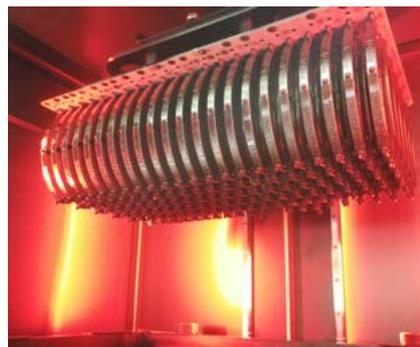
Joe Palmer, the Senior Design and Development Engineer who is leading the AMRC's response, said the team has coordinated its efforts with Sheffield Teaching Hospitals NHS Foundation Trust to ensure visors are being delivered to the local hospitals with the greatest need. He said:

"We know these visors are needed now and not in a few

weeks' time, so we're really pleased that we were able to get almost 1,000 out of the door by Monday and into the hands of the frontline NHS workers who so desperately need them in order to stay protected as they battle this deadly virus to save lives.

"When the visors were delivered to the medical stores department at the Hallamshire Hospital, everyone there was really appreciative and that was a real boost for our team.

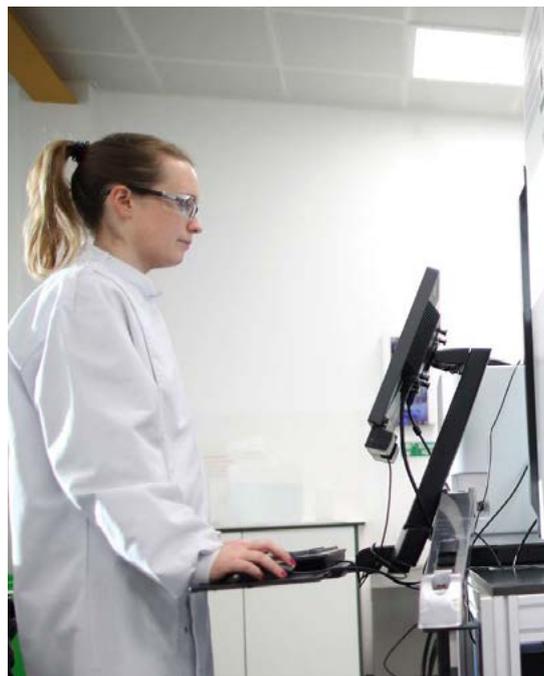
"The AMRC is so grateful to those who have stepped up to help. It's not just been technical staff from the design team – we've had everyone from receptionists, composites engineers and senior project managers volunteer to help with the assembly." ■



**FIND OUT MORE**

## ON THE COVER

# CPI joins national taskforce to develop COVID-19 vaccine



Experts from CPI will join the national drive to identify and produce effective vaccines for COVID-19. They will support efforts to manufacture and formulate novel mRNA vaccine candidates from its facilities in Darlington using its extensive skills and capabilities in the development of biologic pharmaceuticals, formulations and medicines manufacturing

CPI will play a key role in the mRNA workstream, focusing on the development, scale-up, manufacture and supply of the mRNA vaccine candidate under development at Imperial College London.

The workstream is a critical part of the Government's Vaccine Taskforce response that is led by Chief Scientific Advisor Sir Patrick Vallance and Deputy Chief Medical Officer Jonathan Van-Tam. The Taskforce will coordinate activities covering the development, trialling, testing and manufacture of a vaccine

for COVID-19.

The mRNA workstream forms part of the efforts of the BioIndustries Association (BIA)-led Vaccine Manufacturing Group, which aims to ensure that when a vaccine becomes available, it can be rapidly scaled-up and manufactured in considerable quantities. The group is a collaboration of the public sector, industry and academia that builds on the UK's world-leading science base.

Sartorius ambr® 250 system - Biotherapeutics at CPI

Frank Millar, CEO of CPI said: "We are proud to be part of this ambitious and



coordinated approach to rapidly accelerate the development, scale-up and manufacture of potential new vaccines. The collaboration brings together some of the brightest minds from the most innovative institutions and companies that the UK has to offer and represents a significant pillar of the UK's efforts to fight back against COVID-19."

Dick Ely, CEO of the High Value Manufacturing Catapult said: "Production of an effective vaccine is vital to beating COVID-19 and allowing all of us to get back to normal life. The insight, experience and capabilities that CPI brings to meeting the challenge should give the whole country confidence that the taskforce can make rapid progress." ■

[FIND OUT MORE](#)

# MTC provides free face shield design to protect against coronavirus



The MTC has rapidly reacted to a demand for protective visors for healthcare staff in the wake of the COVID-19 outbreak. Following the ongoing success with the Intubation Shield for NHS workers, the MTC has now prototyped and developed a face visor that utilises laser cutting technology, which is available as a free open source download.

With a recent peak in Coronavirus cases, the safety of healthcare professionals has never been so important and personal protective equipment (PPE) plays a vital role. The MTC has been working hard to design, concept, prototype and test the laser cut protective visors with the aim to protect the eyes and face of healthcare workers. A technical specification for the visors has also been created as a result of the research.

Starting with an initial open source concept created by Nottingham Hackspace, the design was modified to meet

user specific requirements and reduce the typical time it would take to manufacture. Using the MTC's state-of-the-art facility and the latest manufacturing technologies, the visor has been laser cut to ensure safety and comfortability and is built using a polypropylene frame and a clear plastic screen. The visor is suitably designed for quick hand-assembly, with build instructions provided within the technical pack.

Preliminary trials at Leicester Royal Infirmary

have proven to be successful and hailed positive feedback, launching the MTC into production of the first 2,000 units for hospitals around the UK. Supply chains and manufacturers are welcomed to continue the production of the visors using the open source technical packs and documentation available for free download. ■

[DOWNLOAD HERE](#)



## ON THE COVER



# Restarting operations?

## Work safety culture doesn't happen by accident

**A**s more businesses prepare to restart operations under very different working conditions, the nuclear industry's established safety culture could provide a model for other sectors, says Huw Jenkins, industrial advisor from the Nuclear AMRC, part of the High Value Manufacturing Catapult. Usually helping companies in South Wales and the West Midlands become Fit For Nuclear, he introduces the essential attitudes and behaviours for a safe return to work.

This month's VE day anniversary reminded us how the British can be at their best in adversity, working together to defeat a common foe. In the current Covid-19 crisis, we can be proud of the selflessness of our health and care workers, and the kind acts of volunteers

helping out those less fortunate.

The British instinctively dislike being told what to do, being generally more amenable to reasoned polite request. "Policing by consent" has been the basis of our approach since the 19th century, and there's been widespread opprobrium for heavy-handed applications of lockdown law by some officers.

You'd expect British workers to embrace a culture that works by consent – a culture that is characterised by leaders setting an example, and individuals accepting personal responsibility.

That is the basis of nuclear safety culture.

This safety culture applies to every business working in the nuclear supply chain, not just those managing radioactive or fissile materials. Any seemingly minor quality issue in the supply chain has the potential to become a safety problem for an operating reactor or waste store, maybe decades into the future.

Many of the companies we help through the Fit For Nuclear programme say that upgrading their safety culture is one of the most valuable improvements



they make, bringing business benefits that go well beyond their work for the nuclear sector.

Nuclear safety culture has eight internationally recognised characteristics, which I've listed below, along with some questions to ask about how they can be applied within a business in our accompanying web article. Not all will be applicable to every sector, but the essential attitudes and behaviours can help save lives in manufacturing, construction and beyond.

How well does your company culture match up?

1. **Everyone is personally responsible for safety.**
2. **Leaders demonstrate their commitment to safety.**
3. **Trust permeates the organisation.**
4. **Decision-making reflects the safety-first approach.**
5. **Nuclear technology is recognised as special and unique.** (This one is really only for companies in the nuclear supply chain, although every business should understand the specific requirements of the industry they work in.)
6. **A questioning attitude is cultivated.**
7. **Organisational learning is embraced.**
8. **Safety undergoes constant examination.**

Ultimately, the key to work safety culture is shared responsibility. While it's always the legal responsibility of the employer to provide a safe working environment, including all necessary PPE, everyone from the boardroom to the shopfloor needs to take personal responsibility for protecting the health and safety of themselves and their colleagues. ■

[FIND OUT MORE](#)

## Low-oxygen scuba rebreather repurposed to help coronavirus patients

Oxygen has been in limited supply, due to the increasing need for ventilators to support critically ill people in hospital suffering from COVID-19. Vobster Diving Limited manufactures rebreather equipment for scuba diving, and MD Martin Stanton came up with an idea for how to repurpose this for medical ventilator applications to clean and reuse oxygen, thus reducing oxygen consumption

in hospitals.

The company turned to WMG for support and advice, and we were able to put them in touch with Government health officials, in order to make this idea a reality. Accessing ventilator products that meet medical standards has been a problem for many hospitals in this crisis. However, the medical rebreather (based on the scuba version) sourced components that were already approved for



use in healthcare, this greatly expedited the certification process, and will help ensure that hospitals have access to a safe and approved product.

Last month, the concept was trialled and presented to the Cabinet Office, who have invested in the product. ■

[FIND OUT MORE](#)



# Manufacturing the Future Workforce

**T**he workforce crisis in UK manufacturing is well known. Repeated surveys show that some 80% of UK manufacturers struggle to recruit the talents they need to compete and anticipate increasing recruitment pressures linked to the pace of technological change. They are also struggling to access the quantity and quality of provision necessary to upskill their current workforce.

Recognising that the value of its work to support innovation would be undermined unless industry could access the skilled workforce needed to exploit new technologies, the High Value Manufacturing (HVM) Catapult, with partners from the National Physical Laboratory (NPL) and TWI and support from the Gatsby

Foundation, worked to identify and capture good practice on the development of the future workforce and how centres of innovation in other countries successfully contribute.

The Manufacturing the Future Workforce report, published today, finds that truly successful innovation is dependent on the availability of the right skills needed for its full exploitation. It warns that, without change, the UK's current approach to workforce development will fail to deliver the skilled workers UK firms need to succeed in challenging markets. Built from much greater connectivity between stakeholders, it recommends a new approach involving better foresighting and forecasting of future needs and making significant improvements to learning delivery. The headline

message is that centres of innovation have a unique contribution to make to a new Skills Value Chain.

## **Our recommendations**

The report makes 5 recommendations based on good practice identified around the world. They are that the UK should:

- 1. Develop and pilot the application of skills foresighting bringing together groups of education and technology specialists**



2. Support the development of Higher Technical Qualifications and National Standards
3. Develop modular training and resources to support future workforce skills development
4. Promote 'Learning Factories' as an education model to enable industrial digitalisation.
5. Improve recognition and funding of modular and lifelong learning

The report highlights that there is a very real opportunity for the UK to catch up with and then secure a competitive advantage from its research and innovation communities. The report's recommendations set out a blueprint for the UK to do this, by leveraging those communities' knowledge and understanding in a Skills Value Chain. From foresighting skills needs and supporting national standards to developing modular training and lifelong learning models, centres of innovation and industry can lead the way. But the UK can only succeed if government stakeholders, industry and academia work together with a common purpose to equip the UK's future manufacturing workforce. ■

**FIND OUT MORE**

The HVM Catapult has a wealth of quantitative and qualitative data on the impact it is having on the companies we work with. Our case studies give a good impression of the value we have added to many companies across all sizes and all sectors. Maybe we could help your business? There is a cost involved, but we can signpost sources of funding, for example, through Innovate UK. Email us at [info@hvm.catapult.org.uk](mailto:info@hvm.catapult.org.uk) if you'd like more information or to discuss working with us.



## Afghanistan veteran hails 'game changing' mobility device

A disabled former Royal Marine Commando has hailed the sleek, space-age mobility devices, designed and prototyped at the University of Sheffield Advanced Manufacturing Research Centre (AMRC), as a 'game changer for users the world over'.

A fully-functioning prototype has been manufactured by AMRC engineers which incorporates an electrically actuated arm to raise users to a 'social height', multi-directional all-terrain wheels, the ability to turn on the spot and a 'cool' design inspired by Star Wars.

Called Victor, it is the brainchild of Cpl Phil

Eaglesham, founder of Conquering Horizons, who contracted Q Fever during active service in Afghanistan in October 2010. The disease quickly progressed to mean the father-of-three, a competitor for Team Ireland at the Rio 2016 Paralympics, is now completely reliant on a wheelchair.

Brian Meaden, fellow founder of Conquering Horizons, said Victor could be ready to launch to the public late next year: "Our vehicle is cool in design, robust, has off-road capability, four-wheel drive and can lift users to a social height; it is a game changer for all ages, sizes, weights and disabilities.

## Current COVID-19 funding opportunities

### Chancellor announces £1.25m to protect firms driving innovation

The comprehensive package includes a new £500 million loan scheme for high-growth firms, called the Future Fund, and £750 million of targeted support for small and medium sized businesses focusing on research and development.

[FIND OUT MORE](#)

### Government COVID-19 Business Support

Coronavirus (COVID-19) support available to businesses:

- Loans, tax relief and cash grants will be available
- Employers can apply for staff to get up to 80% pay if they can't work
- Self-employed people will receive up to £2,500 per month in grants for at least 3 months

[FIND OUT MORE](#)

### Innovate UK support

An update on the support available to businesses from Innovate UK due to COVID-19 and advice for award holders.

[FIND OUT MORE](#)

# WORK WITH US

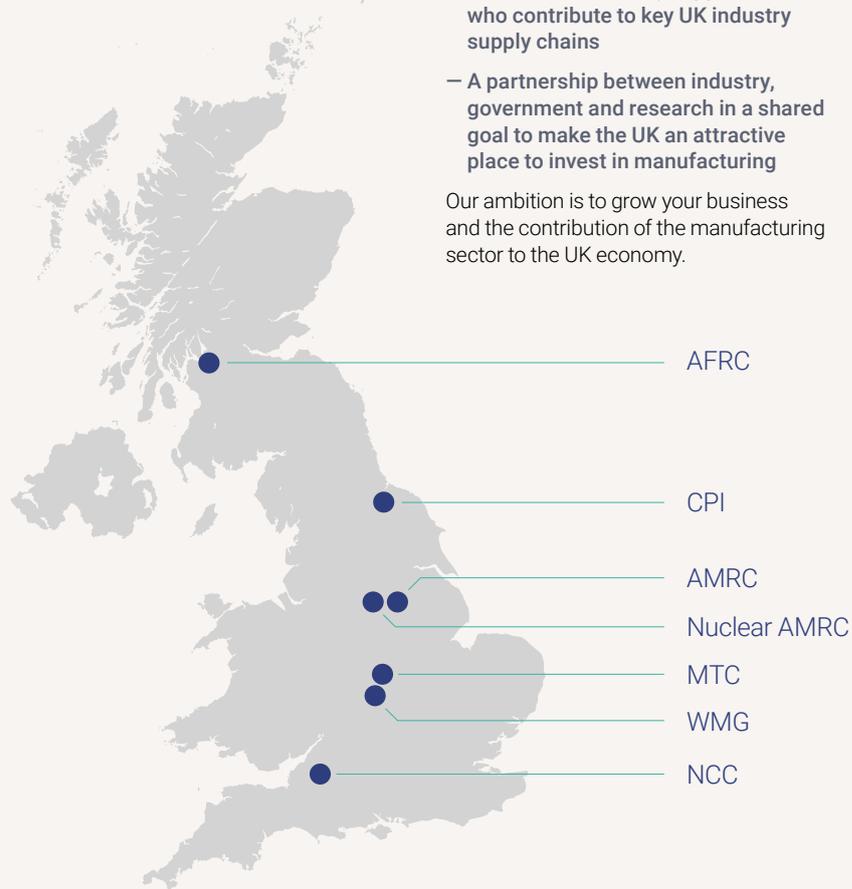
The High Value Manufacturing (HVM) Catapult is here to help UK businesses of all sizes accelerate new concepts to commercial reality.

Working through seven world-class centres of industrial innovation, we provide access to the specialist equipment and expertise you need to help investigate new technologies and processes and test their application. We can also help you to improve existing processes. We're here to help you strip away the risks of innovation and make investment decisions when you are confident that an idea can be scaled up to deliver on a commercial scale.

Our services are available to firms of all shapes and sizes, from FTSE-listed companies to SMEs deep in the supply chain. They include:

- Capability which spans from basic raw materials through to high integrity product assembly processes
- World-class facilities and skills to scale-up and prove high value manufacturing processes
- A network of leading suppliers who contribute to key UK industry supply chains
- A partnership between industry, government and research in a shared goal to make the UK an attractive place to invest in manufacturing

Our ambition is to grow your business and the contribution of the manufacturing sector to the UK economy.



For more information or to discuss working with the HVM Catapult, please contact:

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